# EPA

United States Environmental Protection Agency
Washington, DC 20460

## Work Assignment

Work Assignment Number: 1-71

☐ Other ☐ Amendment Number:

| Contract Number | Contract Period | Title of Work Assignment/SF Site Name |
|---|---|---|
| EP-C-14-001 | 11/01/2013 To 10/31/2015 | Comment Tracker Database |
| | Base Option Period Number 1 | |

Contractor: ICF INCORPORATED, L.L.C.

Specify Section and paragraph of Contract SOW: C. Risk Assessment Data Bases and Computer Tools

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [ ] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 06/10/2015 To 10/31/2015

Comments:

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

SFO (*Max 2*): ☐

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

| Line | DCN (Max 6) | Budget/FY (Max 4) | Appropriation Code (Max 6) | Budget Org/Code (Max 7) | Program Element (Max 9) | Object Class (Max 4) | Amount (Dollars) | (Cents) | Site/Project (Max 8) | Cost Org/Code (Max 7) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |

### Authorized Work Assignment Ceiling

Contract Period: 11/01/2013 To 10/31/2015 — Cost/Fee: — LOE:

This Action:

Total:

### Work Plan / Cost Estimate Approvals

Contractor WP Dated: — Cost/Fee: — LOE:

Cumulative Approved: — Cost/Fee: — LOE:

| | |
|---|---|
| Work Assignment Manager Name: Susan Rieth<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number: 703-347-8582<br>FAX Number: |
| Project Officer Name: Melissa Revely-Wilson<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number: 703-347-8523<br>FAX Number: 703-347-8696 |
| Other Agency Official Name:<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number:<br>FAX Number: |
| Contracting Official Name: Adam Meier<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number: 513-487-2852<br>FAX Number: 513-487-2107 |

**PERFORMANCE WORK STATEMENT**
**CONTRACT NO. EP-C-14-001**
**WA 1-71**

---

## TITLE: Comment Tracker Database

---

**Principal Section & Paragraph of SOW:** ***C. Risk Assessment Data Bases and Computer Tools***

**PERIOD OF PERFORMANCE: Date of approval – October 31, 2015**

## I. PURPOSE

The purpose of the work assignment is to provide services to the U.S. Environmental Protection Agency's (EPA) National Center for Environmental Assessment (NCEA), Office of Research and Development (ORD), specifically to provide software tools and templates to support management of comments on draft Integrated Risk Information System (IRIS) health assessments received at all stages of assessment development. The software tools will assist the IRIS Program in organizing, searching, sorting, and developing responses to comments.

## II. BACKGROUND

EPA's IRIS Program is a human health assessment program that evaluates quantitative and qualitative information on health effects that may result from exposure to environmental contaminants. Further details are provided in performance work statements for WA 1-7 and 1-8, and at http://www.epa.gov/iris/.

Each IRIS chemical assessment is submitted for comment at a number of stages in assessment development, including agency and interagency review, public comment, and external peer review (currently through the Chemical Assessment Advisory Committee of the EPA Science Advisory Board), resulting in numerous comments on each draft assessment.

Given the numerous review comments received for IRIS assessments, an information management tool is needed to support management of comments. The IRIS Program also needs the ability to examine and compare comments and responses across chemicals to improve consistency, eliminate duplication of effort, and identify recurring issues. The proposed solution is a Comment Tracker database(s) that will serve as an information management tool to facilitate the capture, review, categorization, organization, and response to comments received during assessment development. It will also allow analysis of comments within and across assessments.

A Comment Tracker database has been developed within NCEA using Microsoft Access. This prototype database provides many of the database features needed to manage comments, although some of these features are not currently functioning.

Some performance objectives for the database system include:

- Ease of use and short learning curve.
- Facilitates both responses to individual comments, as well as allows grouping similar comments (within an assessment) and writing a single response for the grouped comment.

- Accessible by numerous EPA staff and contractors (preferably simultaneously). Ideally, the database system allows multiple users to work on a single assessment's comments simultaneously.
- Organizes comments and responses by assessment and allows reorganization by EPA staff.
- Allows comparison of comments and responses to them across different assessments.
- Allows control by the EPA Assessment Manager of access and revisions (for each assessment separately), including field level control and ability to lock input to prevent accidental changes to field data.
- Allows flagging of major issues with a short list of tags (scientific, science-policy, etc. – TBD).
- Database should have download/off-line capacity to enable real-time searches during meetings without internet access.
- Database for each chemical can be finalized and archived when the assessment is posted.
- Reports (compatible with MS/Word) can be made for one or several assessments. Report format/content can be customized to meet different needs.
- Online platform with public and private sections.

Some significant decisions about the database system include:

- Software platform: EPA currently has a prototype in MS/Access
- Online platform or EPA server or both?
- Method of comparing and querying databases for different assessments: the prototype uses a front-end (also in MS/Access) that permits querying comments across chemicals.

A working database is needed by July 8. This will probably be based on the existing EPA prototype, possibly with improvements that are feasible within that time frame. That initial database will be used by EPA to assemble comments and draft responses for several assessments (expected to have final SAB comments in mid-July). EPA staff experience with the initial database will inform subsequent discussions with the contractor and technical direction regarding improvements to database features and performance. Comment Tracker development will continue during the period of performance until EPA is satisfied that essential performance objectives are met.

## III. SCOPE OF WORK: TASKS AND DELIVERABLES

### Work Plan

The contractor shall prepare a Work Plan and cost estimate. The Work Plan should describe, in brief, a phased approach for conducting this work consistent with EPA's requested schedule, and methods and procedures that will be used to insure that the database performs correctly (e.g., code review, inspection, and testing). This work assignment does not require a QAPP.

This work assignment does not involve use of existing data or collection of new data. Existing comments and responses may be used for the purpose of designing the database and testing the functioning of database, but will not be used for any other purpose under this work assignment.

### Task 1. Initial Design of Comment Tracker Database

The contractor shall develop a proposal for the database design and platform based on meetings and communications with EPA staff, examination of the prototype to be provided by EPA, and consideration of the performance objectives outlined above. Alternatives and trade-offs may be described and compared. The

contractor shall comment specifically on how the functional design and software implementation of the EPA prototype could be improved. This Task shall be conducted simultaneously with Task 2.

Several telephone conferences or meetings with EPA staff shall be required in June and July.

Deliverables and due dates:

Database prototype: Proposal (oral or written) on improvements that are feasible by July 8
Due: June 16 or earlier if possible

Database revision: Draft proposal and final proposal; these proposals need not be formal or long
Due: draft on June 24, final on July 15 (these dates may be changed by written technical direction)

Materials to be provided separately:
Prototype Comment Tracker database and related modules

**Task 2. Development of Comment Tracker Database**

The contractor shall discuss design options and useful improvements with EPA under Task 1; this should be informed by examination of the prototype.

Deliverables and due dates:

Initial prototype: due July 8, 2015 (this date may be changed by written technical direction)

Revised databases: at least two draft versions for EPA review
Due: To be specified in written technical direction after consultation with the contractor; in lieu of technical direction, two draft versions will be delivered by July 31 and August 28

## V. SCHEDULE OF DELIVERABLES

| **Task** | **Schedule** (all days are elapsed calendar days unless otherwise stated) |
|---|---|
| Task 1 | Proposal for feasible changes to prototype: June 16<br>Proposal for revisions to prototype design: June 24 and July 15<br>(these dates may be changed by technical direction) |
| Task 2 | Prototype: July 8<br>Draft databases: July 31 and August 28 (these dates may be changed by technical direction) |

The contractor should consult with EPA if the proposed schedule of deliverables cannot be achieved, and work with EPA to identify what can be accomplished to meet EPA's need for a working Comment Tracker database.

## VI. NOTICE REGARDING GUIDANCE PROVIDED UNDER THIS PROJECT

Guidance is strictly limited to technical and analytical support. The contractor shall not engage in activities of an inherently governmental nature such as the following:

(1) Formulation of Agency policy
(2) Selection of Agency priorities
(3) Development of Agency regulations

Should the contractor receive any instruction from an EPA staff person that the contractor ascertains to fall into any of these categories or goes beyond the scope of the contract or work assignment, the contractor shall immediately contact the PO or WAM.

The contractor shall also ensure that work under this work assignment does not contain any apparent or real personal or organizational conflict of interest. The contractor shall certify that none exist at the time the proposal is submitted to EPA. The Contractor shall be responsible for obtaining a conflict of interest certification for any subcontractor services.

## VII. SPECIAL CONDITIONS AND ASSUMPTIONS

The contractor shall provide regular updates on progress and any issues that need to be resolved to the WAM by telephone or by email. Any technical directions made during informal discussions shall be issued promptly by the EPA WAM in writing (to include email).

## VIII. EPA CONTACTS

EPA Work Assignment Manager (WAM)

Susan Rieth
703-347-8582 (voice), 703-347-8689 (fax), email Rieth.Susan@epa.gov
Mailing Address:
U.S. EPA, ORD/NCEA (Mail Code 8601 P)
1200 Pennsylvania Ave, NW, Washington, D.C. 20460

Courier Deliveries:
U.S. EPA. Office of Research and Development, National Center for Environmental Assessment
Two Potomac Yard North, 7th Floor N-7811, 2733 S. Crystal Drive, Arlington, VA 22202

Alternate WAM

Louis D'Amico
Damico.louis@epa.gov
(703) 347-0344

# EPA

United States Environmental Protection Agency
Washington, DC 20460

## Work Assignment

Work Assignment Number: 1-71

☐ Other ☐ Amendment Number:

| Contract Number | Contract Period | Title of Work Assignment/SF Site Name |
|---|---|---|
| EP-C-14-001 | 11/01/2013 To 10/31/2015 | Comment Tracker Database |
| | Base Option Period Number 1 | |

Contractor: ICF INCORPORATED, L.L.C.

Specify Section and paragraph of Contract SOW: C. Risk Assessment Data Bases and Computer Tools

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [X] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 06/10/2015 To 10/31/2015

Comments:

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

SFO (*Max 2*): ☐

| Line | DCN (Max 6) | Budget/FY (Max 4) | Appropriation Code (Max 6) | Budget Org/Code (Max 7) | Program Element (Max 9) | Object Class (Max 4) | Amount (Dollars) | (Cents) | Site/Project (Max 8) | Cost Org/Code (Max 7) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |

### Authorized Work Assignment Ceiling

| | Cost/Fee: | LOE: |
|---|---|---|
| Contract Period: 11/01/2013 To 10/31/2015 | $0.00 | 0 |
| This Action: | $40,273.00 | 365 |
| Total: | $40,273.00 | 365 |

### Work Plan / Cost Estimate Approvals

| | Cost/Fee: | LOE: |
|---|---|---|
| Contractor WP Dated: 06/30/2015 | $40,273.00 | 365 |
| Cumulative Approved: | $40,273.00 | 365 |

| | |
|---|---|
| Work Assignment Manager Name: Susan Rieth<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number: 703-347-8582<br>FAX Number: |
| Project Officer Name: Melissa Revely-Wilson<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number: 703-347-8523<br>FAX Number: 703-347-8696 |
| Other Agency Official Name:<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number:<br>FAX Number: |
| Contracting Official Name: Adam Meier<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number: 513-487-2852<br>FAX Number: 513-487-2107 |

# EPA

United States Environmental Protection Agency
Washington, DC 20460

## Work Assignment

Work Assignment Number: 1-73

☐ Other ☐ Amendment Number:

| Contract Number | Contract Period | Title of Work Assignment/SF Site Name |
|---|---|---|
| EP-C-14-001 | 11/01/2013 To 10/31/2015 | Bayesian Network |
| | Base Option Period Number 1 | |

Contractor: ICF INCORPORATED, L.L.C.

Specify Section and paragraph of Contract SOW: A. Assessment Issues and Documents;

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [ ] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 09/01/2015 To 10/31/2015

Comments:
A. Assessment Issues and Documents; 2. Exposure Assessment Documents for Contaminants, Mixtures, Media- or Site-Specific Cases; ¶ D; 4. Public Health Outcomes

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

SFO (*Max 2*) ☐

| Line | DCN (Max 6) | Budget/FY (Max 4) | Appropriation Code (Max 6) | Budget Org/Code (Max 7) | Program Element (Max 9) | Object Class (Max 4) | Amount (Dollars) | (Cents) | Site/Project (Max 8) | Cost Org/Code (Max 7) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |

### Authorized Work Assignment Ceiling

| | Cost/Fee: | LOE: |
|---|---|---|
| Contract Period: 11/01/2013 To 10/31/2015 | | |
| This Action: | | |
| Total: | | |

### Work Plan / Cost Estimate Approvals

| | Cost/Fee: | LOE: |
|---|---|---|
| Contractor WP Dated: | | |
| Cumulative Approved: | | |

| | |
|---|---|
| Work Assignment Manager Name: Michael Broder<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number: 202-564-3393<br>FAX Number: |
| Project Officer Name: Melissa Revely-Wilson<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number: 703-347-8523<br>FAX Number: 703-347-8696 |
| Other Agency Official Name:<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number:<br>FAX Number: |
| Contracting Official Name: Adam Meier<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number: 513-487-2852<br>FAX Number: 513-487-2107 |

**PERFORMANCE WORK STATEMENT**
**CONTRACT EP-C-14-001**
**WA 1-73**

---

**TITLE: Science Technical Support for development of a Bayesian Network to examine Phthalate Exposure for Cumulative Risks**

---

**Specify Section & Paragraph SOW:**
**A. Assessment Issues and Documents; 2. Exposure Assessment Documents for Contaminants, Mixtures, Media- or Site-Specific Cases; ¶ D; 4. Public Health Outcomes**

**PERIOD of PERFORMANCE: CO approval through October 31, 2015**

## I. Purpose

The purpose of work assignment is to support the U.S. Environmental Protection Agency's (EPA) Office of Science Advisor (OSA), in the construction of a source to exposure bayesian network for a phthalates case study (DBP, DEHP, DINP).

## II. Background

Multiple aspects of the environment in which we live, learn, work, and play impact our health. Addressing multiple exposures to chemical and nonchemical stressors and cumulative risks and impacts in environmental decisions has long been a challenge for EPA and a concern of communities and environmental justice organizations. EPA's RAF is currently developing Agency guidelines on cumulative risk assessment, building upon existing methods for chemical mixtures risk assessment routinely employed by EPA programs and regions. EPA's CRA Guidelines will advance the science further, introducing additional quantitative and qualitative analytical strategies for examining combinations of multiple chemical, physical and biological stressors and understanding how to factor in population vulnerabilities, including socio-economic stressors. The recently completed report "Approach to Cumulative Exposure Assessment for Phthalate Ester Compounds In the Context of the Toxic Substances Control Act: A Case Study" describes the source to exposure continuum for several phthalates (PEs), and the issues associated with attempting to attribute PE exposure to specific TSCA product use categories. Bayesian networks (BN) are identified as a complementary tool to the case study to aid incorporation of qualitative and quantitative information using probabilistic reasoning.

## III. Statement of Work

### A. Objective: To build a source to exposure Bayesian Network (BN) for the phthalates (DBP, DEHP, DINP) in a previously completed case study.

### B. Specific Requirements
### Task 1: Submission of project plan.

The contractor will schedule a conference call with the COR to discuss tasks and arrange a project schedule within 3 days of receipt of work assignment.

**Task 2: Preparation of Quality Assurance Project Plan.**

The contractor will prepare a Quality Assurance Project Plan (QAPP) consistent with standard practices, consult with EPA technical advisors to ensure the QAPP addresses necessary element of the work assignment, and submit the plan for approval.

**Task 3: Construction of a BN to characterize the relationship between TSCA use categories, the identified phthalates, and the health risks of phthalate exposure in sensitive populations.**

The contractor will consult with EPA technical advisors to identify appropriate staff or subcontractors to develop the BN.

The contractor will consult with EPA technical advisors to identify and define important variables for the BN.

Using the same data[1] sources utilized in the attached phthalate case study (National Health and Nutrition Examination Survey [NHANES], Chemical Data Reporting [CDR] database, etc.) with other additional data sources as necessary, recommend a most favored (best fit) network structure for variables.

Elicit expert advice as necessary, documenting uncertainties and range of recommendations.

Choose an appropriate distribution for the variables, and consult with EPA technical advisors.

Utilize AgenaRisk[2] or similar software to build the BN (provided by EPA).

Document steps in process, report on feasibility of software, and evaluate transferability to other applications.

The Contractor will provide a project plan for EPA review and comment, a draft monograph for review, a final draft for review, and a final approved manuscript. Final coordination of the manuscript shall follow editorial requirements under Task 3. The Contractor shall communicate regularly with the EPA COR (and technical advisor/s) at identified steps in the project plan to ensure suitable detail, focus and rationales.

**Task 4: Preparation of manuscript**

The Contractor, as directed by the COR/WAM through written technical direction, shall develop a technical manuscript based on work conducted under Task 1. The contractor shall provide both science/technical editorial services for the final copy of the manuscript generated. The range of editorial services shall include a review of the paper for meaning, formatting, and assuring that paper meets prescribed style requirements, spelling and grammar checks, researching references for accuracy, formatting bibliography, checking text for clarity, and formatting of graphics such as charts, symbols, and equations. The contractor shall discuss recommended edits for the paper with EPA technical advisors in consultation with the WAM, and prior to incorporating edits.

After completion of the manuscript, the contractor shall send a copy of the paper to the COR. The COR and

1 All data is de-identified.

2 AgenaRisk software makes the task of discretizing continuous variables unnecessary as it implements "dynamic discretization", which reduces time spent on defining appropriate intervals. It can also handle hybrid models, or models that contain continuous variables, along with other non-continuous variables (boolean, ranked, etc.).

other EPA staff identified by the COR will review the final manuscripts over a 21 day period. At the end of the EPA review, the COR will send the manuscripts and any additional comments to the contractor. Upon receipt of the comments, the contractor shall consult with the authors on significant comments. The contractor shall edit the manuscripts according to the COR's comments. The contractor may sub-contract expertise necessary for specialized review and content editing and revisions.

The contractor shall finalize all manuscripts and submit camera ready copies of the manuscripts to the WAM in MS word formats after incorporating the final comments from the WAM. The contractor shall also provide hard copies of each manuscript if requested.

## IV. Schedule of Deliverables

1. The contractor shall send EPA all reports in accordance with the terms of the basic contract.

2. The contractor shall start the approved work plan with an approved QAPP and schedule. A draft product is sought for task #3 by October, 2015, and task #4 tentatively by October. 30, 2015, but subject to change based on TD by the COR.

3. Outputs from data analysis and indicator preparation may include charts, graphics, MS Excel files and descriptive text.

4. Revised manuscripts/reports – due two weeks upon receipt of comments from COR.

## V. Other Requirements

Periodic meetings between the EPA and contractor work assignment managers are encouraged to discuss any questions that may arise during performance or completion of this work assignment. At the EPA COR's discretion, these meetings may occur via teleconference or video conferences. The Contractor shall document these meetings and submit copies of this correspondence to the EPA WAM.

The EPA COR may identify one or more EPA technical representatives for this work assignment. Interaction between the contractor and any EPA technical representative(s) designated by the PO is solely for the purpose of presenting and discussing the information, analyses, results, or presentations related to this work assignment. These interactions do not result in direction to the contractor.

All deliverables shall be reviewed for conformance to the requirements of this work assignment before being approved as final.

The contractor shall comply with other applicable requirements for final work assignment reports stipulated in contract.

## VI. Notice Regarding Guidance Provided Under this Project

Guidance is strictly limited to technical and analytical support. The contractor shall not engage in activities of an inherent governmental nature such as the following:

(1) Formulation of Agency policy

(2) Selection of Agency priorities
(3) Development of Agency regulations

Should the contractor receive any instruction from an EPA staff person that the contractor ascertains to fall into any of these categories or goes beyond the scope of the contract or work assignment, the contractor shall immediately contact the PO or COR/WAM.

The contractor shall also ensure that work under this work assignment does not contain any apparent or real personal or organizational conflict of interest. The contractor shall certify that none exist at the time the proposal is submitted to EPA.

## VII. Special Conditions and Assumptions

The contractor shall hold a conference call with the EPA COR/WAM at the initiation of the work assignment, and shall provide a bi-weekly update to the WAM by telephone for the duration of the work assignment, in addition to the standard reporting requirements of the contract.

## VIII. EPA Contact Information

Copies of all correspondence pertaining to the performance of this work assignment shall be sent to the PO.

## IX. Contract Officer's Representative (COR)

Lawrence Martin
Science Coordinator
Risk Assessment Forum
U.S. EPA Office of Science Advisor
1200 Pennsylvania Avenue, N.W. (8105-R)
Washington, DC 20460
voice - 202.564.6497

**Alt COR**
Michael Broder
Office of the Science Advisor
US EPA (8102-R)
Office of Research and Development
1200 Pennsylvania Avenue, NW
Washington, DC 20460
Telephone: (202) 564-3393
Fax: (202) 564-2070

# EPA

United States Environmental Protection Agency
Washington, DC 20460

## Work Assignment

Work Assignment Number: 1-74

☐ Other ☐ Amendment Number:

| Contract Number | Contract Period | Title of Work Assignment/SF Site Name |
|---|---|---|
| EP-C-14-001 | 11/01/2013 To 10/31/2015 | Phthalate Exposure |
| | Base Option Period Number 1 | |

Contractor: ICF INCORPORATED, L.L.C.

Specify Section and paragraph of Contract SOW: See comments

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [ ] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 08/19/2015 To 10/31/2015

Comments:
A. Assessment Issues and Documents; 2. Exposure Assessment Documents for Contaminants, Mixtures, Media- or Site-Specific Cases; ¶ D; 4. Public Health Outcomes

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

SFO (*Max 2*) ☐

| Line | DCN (Max 6) | Budget/FY (Max 4) | Appropriation Code (Max 6) | Budget Org/Code (Max 7) | Program Element (Max 9) | Object Class (Max 4) | Amount (Dollars) | (Cents) | Site/Project (Max 8) | Cost Org/Code (Max 7) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |

### Authorized Work Assignment Ceiling

| | Cost/Fee: | LOE: |
|---|---|---|
| Contract Period: 11/01/2013 To 10/31/2015 | | |
| This Action: | | |
| Total: | | |

### Work Plan / Cost Estimate Approvals

| | Cost/Fee: | LOE: |
|---|---|---|
| Contractor WP Dated: | | |
| Cumulative Approved: | | |

| | |
|---|---|
| Work Assignment Manager Name: Lawrence Martin<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number: 202-564-6497<br>FAX Number: |
| Project Officer Name: Melissa Revely-Wilson<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number: 703-347-8523<br>FAX Number: 703-347-8696 |
| Other Agency Official Name:<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number:<br>FAX Number: |
| Contracting Official Name: Adam Meier<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number: 513-487-2852<br>FAX Number: 513-487-2107 |

**PERFORMANCE WORK STATEMENT**
**CONTRACT EP-C-14-001**
**WA 1-74**

---

**TITLE: Science Technical Support for development of a Bayesian Network to examine Phthalate Exposure for Cumulative Risks**

---

**Specify Section & Paragraph SOW:**
**A. Assessment Issues and Documents; 2. Exposure Assessment Documents for Contaminants, Mixtures, Media- or Site-Specific Cases; ¶ D; 4. Public Health Outcomes**

**PERIOD of PERFORMANCE: CO approval through October 31, 2015**

## I. Purpose

The purpose of work assignment is to support the U.S. Environmental Protection Agency's (EPA) Office of Science Advisor (OSA), in the construction of a source to exposure bayesian network for a phthalates case study (DBP, DEHP, DINP).

## II. Background

Multiple aspects of the environment in which we live, learn, work, and play impact our health. Addressing multiple exposures to chemical and nonchemical stressors and cumulative risks and impacts in environmental decisions has long been a challenge for EPA and a concern of communities and environmental justice organizations. EPA's RAF is currently developing Agency guidelines on cumulative risk assessment, building upon existing methods for chemical mixtures risk assessment routinely employed by EPA programs and regions. EPA's CRA Guidelines will advance the science further, introducing additional quantitative and qualitative analytical strategies for examining combinations of multiple chemical, physical and biological stressors and understanding how to factor in population vulnerabilities, including socio-economic stressors. The recently completed report "Approach to Cumulative Exposure Assessment for Phthalate Ester Compounds In the Context of the Toxic Substances Control Act: A Case Study" describes the source to exposure continuum for several phthalates (PEs), and the issues associated with attempting to attribute PE exposure to specific TSCA product use categories. Bayesian networks (BN) are identified as a complementary tool to the case study to aid incorporation of qualitative and quantitative information using probabilistic reasoning.

## III. Statement of Work

**A. Objective: To build a source to exposure Bayesian Network (BN) for the phthalates (DBP, DEHP, DINP) in a previously completed case study.**

## B. Specific Requirements

### Task 1: Submission of project plan.

- The contractor will schedule a conference call with the COR to discuss tasks and arrange a project schedule within 2 weeks of receipt of work assignment.

### Task 2: Preparation of Quality Assurance Project Plan.

- The contractor will prepare a Quality Assurance Project Plan (QAPP) consistent with standard practices, consult with EPA technical advisors to ensure the QAPP addresses necessary element of the work assignment, and submit the plan for approval.

### Task 3: Construction of a BN to characterize the relationship between TSCA use categories, the identified phthalates, and the health risks of phthalate exposure in sensitive populations.

- The contractor will consult with EPA technical advisors to identify appropriate staff or subcontractors to develop the BN.

- The contractor will consult with EPA technical advisors to identify and define important variables for the BN.

- Using the same data[1] sources utilized in the attached phthalate case study (National Health and Nutrition Examination Survey [NHANES], Chemical Data Reporting [CDR] database, etc.) with other additional data sources as necessary, recommend a most favored (best fit) network structure for variables.

- Elicit expert advice as necessary, documenting uncertainties and range of recommendations.

- Choose an appropriate distribution for the variables, and consult with EPA technical advisors.

- Utilize AgenaRisk[2] or similar software to build the BN (provided by EPA).

- Document steps in process, report on feasibility of software, and evaluate transferability to other applications.

- The Contractor will provide a project plan for EPA review and comment, a draft monograph for review, a final draft for review, and a final approved manuscript. Final coordination of the manuscript shall follow editorial requirements under Task 3. The Contractor shall communicate regularly with the EPA COR (and technical advisor/s) at identified steps in the project plan to ensure suitable detail, focus and rationales.

---

1 All data is de-identified.

2 AgenaRisk software makes the task of discretizing continuous variables unnecessary as it implements "dynamic discretization", which reduces time spent on defining appropriate intervals. It can also handle hybrid models, or models that contain continuous variables, along with other non-continuous variables (boolean, ranked, etc.).

**Task 4: Preparation of manuscript**

The Contractor, as directed by the COR/WAM through written technical direction, shall develop a technical manuscript based on work conducted under Task 1. The contractor shall provide both science/technical editorial services for the final copy of the manuscript generated. The range of editorial services shall include a review of the paper for meaning, formatting, and assuring that paper meets prescribed style requirements, spelling and grammar checks, researching references for accuracy, formatting bibliography, checking text for clarity, and formatting of graphics such as charts, symbols, and equations. The contractor shall discuss recommended edits for the paper with EPA technical advisors in consultation with the WAM, and prior to incorporating edits.

After completion of the manuscript, the contractor shall send a copy of the paper to the COR. The COR and other EPA staff identified by the COR will review the final manuscripts over a 21 day period. At the end of the EPA review, the COR will send the manuscripts and any additional comments to the contractor. Upon receipt of the comments, the contractor shall consult with the authors on significant comments. The contractor shall edit the manuscripts according to the COR's comments. The contractor may sub-contract expertise necessary for specialized review and content editing and revisions.

The contractor shall finalize all manuscripts and submit camera ready copies of the manuscripts to the WAM in MS word formats after incorporating the final comments from the WAM. The contractor shall also provide hard copies of each manuscript if requested.

## IV. Schedule of Deliverables

1. The contractor shall send EPA all reports in accordance with the terms of the basic contract.

2. The contractor shall start the approved work plan with an approved QAPP and schedule. A draft product is sought for task #3 by August 15, 2015, and task #4 by October. 30, 2015.

3. Outputs from data analysis and indicator preparation may include charts, graphics, MS Excel files and descriptive text.

4. Revised manuscripts/reports – due two weeks upon receipt of comments from COR.

## V. Other Requirements

Periodic meetings between the EPA and contractor work assignment managers are encouraged to discuss any questions that may arise during performance or completion of this work assignment. At the EPA COR's discretion, these meetings may occur via teleconference or video conferences. The Contractor shall document these meetings and submit copies of this correspondence to the EPA WAM.

The EPA COR may identify one or more EPA technical representatives for this work assignment. Interaction between the contractor and any EPA technical representative(s) designated by the PO is solely for the purpose of presenting and discussing the information, analyses, results, or presentations related to this work assignment. These interactions do not result in direction to the contractor.

All deliverables shall be reviewed for conformance to the requirements of this work assignment before being approved as final.

The contractor shall comply with other applicable requirements for final work assignment reports stipulated in contract.

## VI. Notice Regarding Guidance Provided Under this Project

Guidance is strictly limited to technical and analytical support. The contractor shall not engage in activities of an inherent governmental nature such as the following:

(1) Formulation of Agency policy
(2) Selection of Agency priorities
(3) Development of Agency regulations

Should the contractor receive any instruction from an EPA staff person that the contractor ascertains to fall into any of these categories or goes beyond the scope of the contract or work assignment, the contractor shall immediately contact the PO or COR/WAM.

The contractor shall also ensure that work under this work assignment does not contain any apparent or real personal or organizational conflict of interest. The contractor shall certify that none exist at the time the proposal is submitted to EPA.

## VII. Special Conditions and Assumptions

The contractor shall hold a conference call with the EPA COR/WAM at the initiation of the work assignment, and shall provide a bi-weekly update to the WAM by telephone for the duration of the work assignment, in addition to the standard reporting requirements of the contract.

## VIII. EPA Contact Information

Copies of all correspondence pertaining to the performance of this work assignment shall be sent to the PO.

## IX. Contract Officer's Representative (COR)

Lawrence Martin
Science Coordinator
Risk Assessment Forum
U.S. EPA Office of Science Advisor
1200 Pennsylvania Avenue, N.W. (8105-R)
Washington, DC 20460
voice - 202.564.6497

**Alt COR**
Michael Broder
Office of the Science Advisor
US EPA (8102-R)
Office of Research and Development
1200 Pennsylvania Avenue, NW
Washington, DC 20460
Telephone: (202) 564-3393
Fax: (202) 564-2070

# EPA

United States Environmental Protection Agency
Washington, DC 20460

## Work Assignment

Work Assignment Number: 1-74

☐ Other ☐ Amendment Number:

| Contract Number | Contract Period | Title of Work Assignment/SF Site Name |
|---|---|---|
| EP-C-14-001 | 11/01/2013 To 10/31/2016 | Phthalate Exposure |
| | Base Option Period Number 1 | |

Contractor: ICF INCORPORATED, L.L.C.

Specify Section and paragraph of Contract SOW:

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [X] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 08/19/2015 To 10/31/2015

Comments:

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

SFO (*Max 2*): ☐

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

| Line | DCN (Max 6) | Budget/FY (Max 4) | Appropriation Code (Max 6) | Budget Org/Code (Max 7) | Program Element (Max 9) | Object Class (Max 4) | Amount (Dollars) | (Cents) | Site/Project (Max 8) | Cost Org/Code (Max 7) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |

### Authorized Work Assignment Ceiling

| | Contract Period | Cost/Fee | LOE |
|---|---|---|---|
| | 11/01/2013 To 10/31/2016 | $0.00 | 0 |
| This Action: | | $44,222.00 | 351 |
| Total: | | $44,222.00 | 351 |

### Work Plan / Cost Estimate Approvals

| | | Cost/Fee | LOE |
|---|---|---|---|
| Contractor WP Dated: | 09/14/2015 | $44,222.00 | 351 |
| Cumulative Approved: | | $44,222.00 | 351 |

| | | |
|---|---|---|
| Work Assignment Manager Name: Lawrence Martin<br>(Signature) (Date) | Branch/Mail Code: | |
| | Phone Number: | 202-564-6497 |
| | FAX Number: | |
| Project Officer Name: Melissa Revely-Wilson<br>(Signature) (Date) | Branch/Mail Code: | |
| | Phone Number: | 703-347-8523 |
| | FAX Number: | 703-347-8696 |
| Other Agency Official Name<br>(Signature) (Date) | Branch/Mail Code: | |
| | Phone Number: | |
| | FAX Number: | |
| Contracting Official Name: Adam Meier<br>(Signature) (Date) | Branch/Mail Code: | |
| | Phone Number: | 513-487-2852 |
| | FAX Number: | 513-487-2107 |

# EPA

United States Environmental Protection Agency
Washington, DC 20460

## Work Assignment

Work Assignment Number: 1-78

☐ Other ☐ Amendment Number:

| Contract Number | Contract Period | Title of Work Assignment/SF Site Name |
|---|---|---|
| EP-C-14-001 | 11/01/2013 To 10/31/2016 | SHEDS-HT Model Software |
| | Base Option Period Number 1 | |

Contractor: ICF INCORPORATED, L.L.C.

Specify Section and paragraph of Contract SOW: B - Risk Assessment Methods Research and Developme

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [ ] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 10/06/2015 To 10/31/2015

Comments:

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

SFO (*Max 2*) ☐

| Line | DCN (Max 6) | Budget/FY (Max 4) | Appropriation Code (Max 6) | Budget Org/Code (Max 7) | Program Element (Max 9) | Object Class (Max 4) | Amount (Dollars) | (Cents) | Site/Project (Max 8) | Cost Org/Code (Max 7) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |

### Authorized Work Assignment Ceiling

Contract Period: 11/01/2013 To 10/31/2016 — Cost/Fee: — LOE:

This Action:

Total:

### Work Plan / Cost Estimate Approvals

Contractor WP Dated: — Cost/Fee: — LOE:

Cumulative Approved: — Cost/Fee: — LOE:

| | |
|---|---|
| Work Assignment Manager Name: Kristin Isaacs<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number: 919-541-2785<br>FAX Number: |
| Project Officer Name: Melissa Revely-Wilson<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number: 703-347-8523<br>FAX Number: 703-347-8696 |
| Other Agency Official Name:<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number:<br>FAX Number: |
| Contracting Official Name: Adam Meier<br>(Signature) (Date) | Branch/Mail Code:<br>Phone Number: 513-487-2852<br>FAX Number: 513-487-2107 |

**PERFORMANCE WORK STATEMENT**
**CONTRACT NO. EP-C-14-001**
**WA 1-78**

---

**TITLE**: Development or Refinement of SHEDS-HT Model Software, Data, and Documentation

---

**Specify Section & Paragraph SOW:** B - Risk Assessment Methods Research and Development

**PERIOD of PERFORMANCE: 10-6-15 – 10-31-15**

**Note: Most of the work outlined in this PWS will take place in the next option period, assuming it is exercised and follow-on issued. However, in order to give context to and properly scope the entire project, work is included in this PWS that is expected to take place in both periods. It is expected that only Task 1 (Work Plan Preparation) and Task 2 will be completed during Option Period 1, with all other work being completed in a follow-on work assignment issued during Option Period 2.**

**That being the case, EPA would request that ICF prepare a technical work plan that addresses all work described herein (including that taking place in follow-on period); however, PEA also asks that ICF submit two separate cost estimates, one for Option Period 1, and one for remaining effort using tentative deliverable dates contained herein.**

**Background**

EPA has been developing novel approaches and tools for evaluating, screening and classifying chemicals for the Chemical Safety for Sustainability (CSS) Program based on the potential for biologically-relevant human exposures, for the purpose of informing toxicity testing and prioritization for risk assessment. Program Offices and other Stakeholders need the ability to readily use a flexible and integrated source-to-dose-to-effects model with more realistic exposure modules for evaluating, screening and ranking risks from chemical exposures of different population and age groups.

NERL has developed an efficient and more generalizable high-throughput version of the Stochastic Exposure and Dose Simulations (SHEDS) modeling tool ("SHEDS-HT"). SHEDS-HT is being designed to fill critical gaps in data and numerical algorithms in order to comprehensively characterize key human exposure pathways within a multi-tier and efficient modeling framework. As part of a collaboration with NCCT's ExpoCast project, SHEDS results will be evaluated and incorporated into calibrated consensus exposure predictions within the Systematic Empirical Evaluation of Models (SEEM) framework.

The focus of this project will be to further develop and refine the SHEDS-HT model, its input data, its output data, and its documentation with respect to its 1) chemical space capabilities 2) its suitability for use in new areas of research such as cumulative exposure assessment and life cycle assessment (LCA) projects and case studies.

The WACOR is authorized to provide technical direction in accordance with the contract. This PWS instructs the Contractor to perform the tasks described below.

## I. Description of Tasks

**Task 1. Develop Work Plans**

The Contractor shall submit a work plan outlining the entire technical approach (all tasks) and Option period 1 cost estimate addressing Task 2 of this PWS, quality assurance procedures to be conducted, the schedule for the WA completion. The contractor shall also develop a second cost estimate which will address all remaining work (Tasks 3-5) to be completed in subsequent option period assuming it is exercised. This will be so the EPA can properly scope the entire project within its projected budget.

**Task 2. Review and update Project QA/QC Plan**
Contractor shall review and update the latest project Quality Assurance Project Plan for NERL's Stochastic Human Exposure and Dose Simulation (SHEDS) model, as needed (original QAPP dated April 2011, to be provided by the WACOR). It is anticipated that this QAPP will need major revisions due to changes in programming environment, input data, and potential model applications since the drafting of the original QAPP. If feasible, this QAPP may simply cite where appropriate any new QAPP(s) being developed under other WAs related to the SHEDS-HT model or its use in LCA.

**Task 3. Modify and Test SHEDS-HT to Enable Applicability to Cumulative Exposure Predictions or Life Cycle Analyses**

The Contractor shall modify the SHEDS-HT R code (with corresponding appropriate testing and quality assurance) to implement identified improvements to algorithms, exposure scenarios, or other model features to expand both the utility of the model and chemical and scenario domain of applicability.

**Task 3a. Update SHEDS-HT for Food Contact Materials or Other Exposure Scenarios.**
The contractor will implement code to add a dietary exposure scenario to the main SHEDS-HT model to address Food Contact Materials (FCMs) or food additives. This may involve updating the format and content of SHEDS-HT dietary diaries, adding additional subroutines for calculation of exposures and resulting intakes via the dietary pathway, implementing subroutines or QSAR models for calculation of migration rate, and/or altering the SHEDS-HT output files. The WA-COR will provide technical direction on the specific changes to be made to SHEDS-HT.

**Task 3b. Update SHEDS-HT for Occupational (Industrial or Professional) Exposures.**
Under a separate WA, the contractor will be investigating the feasibility of modifying SHEDS-HT for estimating occupational exposures in both industrial and professional settings. This may include changes to SHEDS-HT algorithms and/or input data (e.g., additional methods for handling definitions of microenvironments and microenvironmental properties or defining products and product uses specific to occupational exposures.) Based on the suitability of the model for such a purpose, under this WA the Contractor will then make any final changes to the SHEDS code and documentation to implement these exposure pathways.

**Task 3C. Implement New Output Information for SHEDS-HT to Support Life Cycle Assessment (LCA) Projects.** Under the direction of the WA-COR, the Contractor shall implement into the official SHEDS-HT R code and documentation any new output metrics needed to support LCA Human Exposure Metrics, specifically product intake fractions or other metrics developed under a separate LCA WA.

Task 3D. **Investigate the Potential for Providing Individual Product-Level Information to SHEDS-HT**. The current SHEDS-HT source file operates on a product-category basis, with distributions of key parameters (e.g., prevalences and weight fractions) provided on an aggregated basis. The contractor shall investigate the potential for SHEDS-HT to accept required information on an individual product basis, which would allow for the ultimate incorporation of product-specific market share and

composition information.

**Task 4. Develop a Distributable R Package of SHEDS-HT**
The Contractor shall take the existing SHEDS-HT R code and input files and convert it into a distributable R package format for uploading to the CRAN R repository. The WA-COR will provide technical direction as to which input files to provide as default information and which SHEDS-HT routines to provide as public tools. The Contractor will follow all CRAN standards for R packages with respect to function definition, help information for each function, definition of public versus hidden functions etc.

**Task 5. Develop Technical Documentation for SHEDS-HT**
The Contractor will develop and or revise a Technical Manual for SHEDS-HT, similar in content scope and format to technical manuals previously developed for the SHEDS-Multimedia Residential and Dietary models. This technical manual will describe all input files (including development of default data), model algorithms, model QA routines, and output files.

**QA/QC Requirements for WA:**

The Contractor will develop an updated QAPP for SHEDS-HT under Task 2. The QAPP will be developed based on the review criteria for category 4 modeling QAPPs in the NERL Quality Management Plan (Exhibit 7.5.2, pg. 79) as well as the EPA Guidance for QAPPs for Modeling (EPA QA/G-5M) that can be found here, http://www.epa.gov/quality/qs-docs/g5m-final.pdf. The QAPP will identify responsibilities of both EPA and the Contractor, and lay out quality objectives and criteria. Note that the Contractor may begin work on Task 1 (Work Plan development) prior to delivery of the QAPP. The Contractor will adhere to the QAPP when completing Tasks 3-5.

**Deliverables:**

A meeting shall be arranged and conducted by the Contractor to discuss the initiation of the tasks with the WACOR. Subsequently, phone conferences or meetings shall be conducted by the Contractor on a bi-weekly basis to discuss with the WACOR the progress and any issues associated with the tasks. The Contractor shall adhere to the following schedule:

| Task | Deliverable | Delivery Schedule |
|---|---|---|
| 1 | Work Plan and cost estimate | 20 days after receipt of WA |
| 2 | Updated SHEDS-HT QAPP | October 31, 2015 |
| | **OPTION 2 DELIVERABLES** | |
| 3 | Distributable SHEDS-HT R package | December 31, 2015 |
| 4 | Updated draft SHEDS-HT documentation | December 31, 2015 |
| 5 | Final SHEDS-HT R package and documentation incorporating all code changes performed under this WA | March 31, 2015 |

**Reporting Requirements:**

The Contractor shall provide monthly progress reports in accordance with the terms of the contract. In addition, the Contractor shall deliver to the WACOR any draft and final reports in electronic format that is readable by windows-based word-processing (Microsoft Word 2003), graphics (Microsoft PowerPoint 2003), spreadsheet (Excel 2003), and database (MySQL) programs.

Work Assignment Contracting Officer's Representative (WACOR):
WACOR: Kristin Isaacs
Phone: (919) 541-2785

Alternate WACOR Name: Peter Egeghy
Phone: (919) 541- 4103

U.S. Environmental Protection Agency
Office: ORS/NERL
Division (Mail Code): HEASD (E205-02)
109 TW Alexander Drive
Research Triangle Park, NC 27711
Phone: (919) 541-2785